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PROBLEMS FOR SOLUTION.

ALGEBRA.

200. Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, O.

No matter what value x be given, the *numerical* value of the expression $(x+2)/(2x^2+3x+6)$ can never exceed $\frac{1}{3}$.

201. Proposed by H. B. LEONARD, B. S., Graduate Student, The University of Chicago.

Solve by quadratics: $x+y+xy=75$; $x^2-y^2=315$.

GEOMETRY.

226. Proposed by W. J. GREENSTREET. A. M., Editor of The Mathematical Gazette, Stroud, England.

The triangles ABC, $A'B'C'$ are in plane perspective, and the corresponding sides BC, $B'C'$, ..., cut in P, Q, R, respectively. AA', ..., cut the line PQR in $P'Q'R'$, respectively. Show that (PP', QQ', RR') is an involution range.

227. Proposed by O. W. ANTHONY. Head of Mathematical Department, DeWitt Clinton High School, New York City.

Construct a parallelogram having given a side and the distances of its vertices from a given point.

228. Proposed by O.E. GLENN. A.M.. Fellow in Mathematics, University of Pennsylvania, Philadelphia. Pa.

Given a point O without a circle S; two arbitrary lines through O cut S in the points A, A', and B, B', respectively. Prove, by pure geometry, that the four circles through OAR, OBR. $OA'R'$, $OB'R'$, respectively, intersect in points collinear with O; R and R' being points upon S arbitrarily chosen.

CALCULUS.

179. Proposed by B. F. FINKEL, A. M., M. Sc., 204 St. Marks Square, Philadelphia. Pa.

Discuss the integrals of the equation $x(1-x)w''+[1-(a+b+1)x]w'-abw=0$ in the vicinities $x=0$, and $x=1$; indicating the form for the latter vicinity when $a+b=1$. Also when $1-a-b$ is an integer l. [From Forsyth's *Linear Differential Equations*, Ex. 6, p. 103].

DIOPHANTINE ANALYSIS.

121. Proposed by L.E. DICKSON, Ph.D., Assisstant Professor in Mathematics, The University of Chicago.

Find a formula for the solutions of $x^2+y^2\equiv 1 \pmod{p}$ valid in all cases $p>2$.